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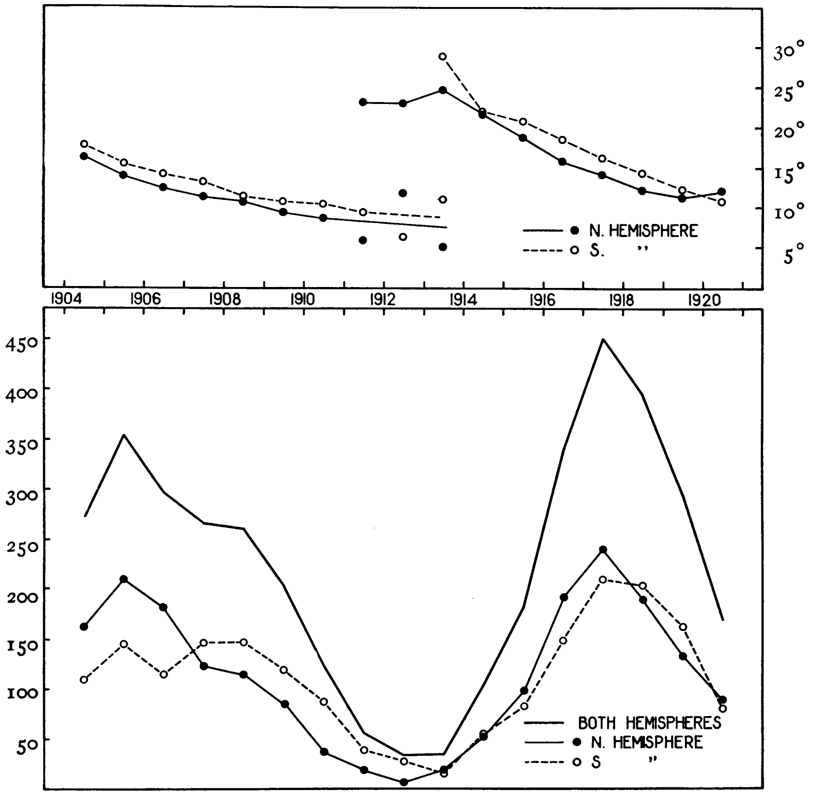
NOTES FROM PACIFIC COAST OBSERVATORIES

Sun-spot Activity During 1920

In these Publications for August, 1919, a note was published on the Variation of Sun-spot Activity during the Present Cycle. The intention was to reprint here the curve of the numbers of sun-spots as given there, at the same time bringing it up to date. In looking over the data, however, it seemed best to separate the material for the two hemispheres. The present curves are from the same sources as before. The points for each quarter are omitted, only the yearly means being plotted. The scale on the curve show-

Mean Latitude of Sun-Spots



Number of Sun-Spots

Figure 1

ing the "Number of Sun-spots" reads the whole number of spots observed during the year, instead of the mean number observed quarterly as in the previous note.

It is interesting to note that since 1904 the average latitude of spots south of the equator has been greater than that of spots in the northern hemisphere. Not only is this true for every yearly mean except that of 1920, but in every quarterly mean the same relation has held except for the last three quarters of 1920 and some in 1914 and 1915. Exception should be made to the years of minimum activity in which the spots, already few, have been separated into high and low latitude zones. The means for these years depend on so few spots that not much significance can be attached to differences shown at this phase. In forming these means each spot group has been given equal weight regardless of its size.

The curve showing the number of sun-spots illustrates the way in which the phase in the northern hemisphere precedes that of the southern hemisphere. This has been noted for several cycles and seems to be characteristic of spot activity.

The increased activity of the summer months of 1919 was only temporary, and the decline in activity has continued to be exceptionally rapid. While not quite as steep as the ascending branch of the curve, the descending portion is thus far much steeper than is ordinarily the case. This would point to an early minimum, except that there is no reason to believe that the decline will necessarily continue at its present rate. In fact, the average latitude of the spots is relatively high considering their numbers. The approach of the spot zones toward the equator is progressing at the normal rate.

As observations of the Sun were made at Mount Wilson on 309 days in 1920, the number of spot groups observed is a fairly complete record. In the accompanying table the average number of groups observed daily is given for each month. For purposes of comparison the values for 1919 are also included.

MEAN NUMBER OF GROUPS OBSERVED DAILY

	1919	1920		1919	1920
January	4.1	3.0	July	6.0	3.1
February	4.7	4.4	August	6.1	2.1
March	4.9	3.7	September	5.1	2.1
April	4.0	2.0	October	4.1	4.2
May	5.7	3.2	November	3.3	2.3
June	8.5	3.5	December	4.0	3.4

These means are closely related to the "Wolf numbers," which are so often used in sun-spot curves. The activity as given by the total number of groups observed may differ somewhat from that indicated by the mean number observed daily, since the latter gives more weight to spots of long duration.

There were eight days in 1920 on which no sun-spots were visible at the time of observation, two in April, two in August, and four in September. The four in September were consecutive days, making the longest quiescent interval since 1915. There was, no doubt, considerable activity on the invisible part of the Sun even on these days, because an active period immediately followed this calm period.

The most notable group of the year was the great group of January and March. An account of the magnetic observations of this group is given in these PUBLICATIONS for August, 1920. Other groups worthy of mention are the large bipolar groups which crossed the central meridian on September 2 and November 5. Both of these were in the southern hemisphere, as was the large group of January and March. The greatest number of separate groups observed on a single day was eight, on February 15. Many of these were small, however, and the spotted area was not as great as on several other days. Many large regular spots have been present as is customary at this phase of spot activity, and there will no doubt be many large spots during the next two or three years before the minimum is reached.

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NOVAE IN THE ANDROMEDA NEBULA

Three more new stars have recently been found on photographs of the great nebula of *Andromeda* made with the 60-inch reflector. Nova No. 18 is 50″ north and 50″ west of the nucleus, nearer than any other so far found except the great nova of 1885, which was 4″ south and 16″ west. The photographic magnitude estimated from all available plates was as follows:

DATE	MAG.	PLATE BY
1920, Oct. 10	17.2	Duncan
Oct. 11	17.4	Duncan
Oct. 14	17.6	Hubble
Oct. 19	>17.2	Seares (seeing too poor to show fainter stars)

This is the first nova found in the *Andromeda* nebula in nearly a year—since October 30, 1919.